

REMARKS

Introductory Comments:

Claims 31-81 and 117-127 are pending and stand rejected under 35 U.S.C. §112, first paragraph. Applicants respectfully traverse this rejection for reasons discussed below.

Overview of the Above Amendments:

New claims 128-141 have been added and pertain to additional embodiments of the invention. Particularly, new claim 128 pertains to an isolated nucleic acid molecule encoding a human Fab molecule, wherein the nucleic acid molecule comprises a nucleotide sequence selected from SEQ ID NOS:15-27. New claims 129-141 recite the individual members of the Markush group specified in claim 128.

Support for these new claims may be found in the claims as originally filed, as well as throughout the specification at, e.g., page 69, lines 22-31.

Rejection of the Claims Under 35 U.S.C. §112, First Paragraph:

Claims 31-81 and 117-127 stand rejected under 35 U.S.C. §112, first paragraph. The Advisory Action states “[t]he claims have not been limited to the exact sequences indicated as meeting the written description requirement: SEQ ID NO: 15-27 and nucleic acids encoding the same amino acid sequences through the degeneracy of the genetic code.” Advisory Action, page 2. Applicants respectfully traverse this rejection and submit that claims 31-81 and 117-141 indeed comply with 35 U.S.C. §112, first paragraph.

First of all, claims 117-127 already pertain to embodiments expressly stated by the Office to be adequately described in the application. In particular, these claims are framed with reference to amino acid sequences encoded by the nucleotide sequences corresponding to sequences in SEQ ID NOS:15-18 and 22-25 which the Office has stated meet the written description requirement. Accordingly, clarification regarding the rejection of claims 117-127 is requested. Similarly, new claims 128-141 recite the sequences of SEQ ID NOS:15-27. Thus, these claims are also believed to be allowable.

With respect to claims 31-81, applicants query what the Office considers

objectionable. All of these claims refer to particular sequences of SEQ ID NOS:15-27, sequences that the Office correctly notes are adequately described in the application. These claims also allow for variation in these sequences by virtue of the recitation "90% sequence identity." The original claims recited homology vis-a-vis these sequences. The application at pages 16-17 defines homology. Thus, it is clear from a review of the application as filed that applicants intended to cover sequences with 90% sequence identity.

In order to comply with the written description requirement, an applicant's specification must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of the invention, i.e., whatever is now claimed. *Vas Cath Inc. v. Mahurkar*, 19 USPQ 1111, 1117 (Fed. Cir. 1991) (cited in MPEP § 2163 and in the Examiner Guidelines on Written Description Requirement). The Examiner has the initial burden of presenting evidence or reasons why persons skilled in the art would not recognize in an applicant's disclosure a description of the invention defined by the claims. *In re Wertheim*, 191 USPQ 90 (CCPA 1976) (cited in MPEP § 2163.04 in the Examiner Guidelines on Written Description Requirement). Moreover, it is axiomatic that a patent specification "need not teach, and preferably omits, what is well known in the art." See, *Spectra-Physics, Inc. v. Coherent, Inc.*, 3 USPQ2d 1737, 1743 (Fed. Cir. 1987); *Hybritech Inc. v. Monoclonal Antibodies, Inc.*, 231 USPQ 81, 94 (Fed. Cir. 1986). Thus, determining whether the written description is satisfied requires reading the disclosure in light of the knowledge possessed by those skilled in the art. *In re Alton*, 37 USPQ2d 1578 (Fed. Cir. 1996). Applying these tenets, applicants submit that the Office has failed to carry its burden and that the present claims indeed comply with the written description requirement of 35 U.S.C. §112, first paragraph.

The Office has failed to supply any "evidence or reasons why persons skilled in the art would not recognize in an applicant's disclosure a description of the invention defined by the claims." *In re Wertheim*, 191 USPQ 90 (CCPA 1976). In fact, a review of the application as a whole, coupled with the knowledge in the art at the time of filing, evidences that the application is more than sufficient to convey with reasonable clarity to those skilled in the art that, as of the filing date sought, they were in possession of the invention. Thus, should this rejection be maintained, applicants request that the Patent

Office provide specific data in support thereof in an affidavit pursuant to 37 CFR §1.104(d)(2).

Not only have applicants claimed embodiments expressly called out in the specification, these embodiments are claimed with reference to a particular structure, i.e., the sequences specified in the figures and in the sequence listing. *Fiers v. Revel*, 25 USPQ2d 1661 (Fed. Cir. 1993) clearly states that DNA may be properly defined by one or more of the parameters "structure, formula, chemical name or physical properties."

Accordingly, there can be no doubt that the claims as they now stand comply with the written description requirement of 35 U.S.C. §112, first paragraph. This basis for rejection should therefore be withdrawn.

CONCLUSION

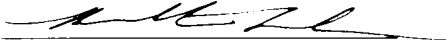
Applicant respectfully submits that the claims comply with the requirements of 35 U.S.C. §112 and define an invention that is patentable over the art. Accordingly, a Notice of Allowance is believed in order and is respectfully requested.

Please direct all further written communications regarding this application to:

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Claims:

New claims 128-141 have been added:

--128. (New) An isolated nucleic acid molecule encoding a human Fab molecule, wherein the nucleic acid molecule comprises a nucleotide sequence selected from the group consisting of SEQ ID NO:15, SEQ ID NO:16, SEQ ID NO:17, SEQ ID NO:18, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22, SEQ ID NO:23, SEQ ID NO:24, SEQ ID NO:25, SEQ ID NO:26, and SEQ ID NO:27.

129. (New) The isolated nucleic acid molecule of claim 128, wherein the nucleic acid molecule comprises the nucleotide sequence of SEQ ID NO:15.

130. (New) The isolated nucleic acid molecule of claim 128, wherein the nucleic acid molecule comprises the nucleotide sequence of SEQ ID NO:16.

131. (New) The isolated nucleic acid molecule of claim 128, wherein the nucleic acid molecule comprises the nucleotide sequence of SEQ ID NO:17.

132. (New) The isolated nucleic acid molecule of claim 128, wherein the nucleic acid molecule comprises the nucleotide sequence of SEQ ID NO:18.

133. (New) The isolated nucleic acid molecule of claim 128, wherein the nucleic acid molecule comprises the nucleotide sequence of SEQ ID NO:19.

134. (New) The isolated nucleic acid molecule of claim 128, wherein the nucleic acid molecule comprises the nucleotide sequence of SEQ ID NO:20.

135. (New) The isolated nucleic acid molecule of claim 128, wherein the nucleic

acid molecule comprises the nucleotide sequence of SEQ ID NO:21.

136. (New) The isolated nucleic acid molecule of claim 128, wherein the nucleic acid molecule comprises the nucleotide sequence of SEQ ID NO:22.

137. (New) The isolated nucleic acid molecule of claim 128, wherein the nucleic acid molecule comprises the nucleotide sequence of SEQ ID NO:23.

138. (New) The isolated nucleic acid molecule of claim 128, wherein the nucleic acid molecule comprises the nucleotide sequence of SEQ ID NO:24.

139. (New) The isolated nucleic acid molecule of claim 128, wherein the nucleic acid molecule comprises the nucleotide sequence of SEQ ID NO:25.

140. (New) The isolated nucleic acid molecule of claim 128, wherein the nucleic acid molecule comprises the nucleotide sequence of SEQ ID NO:26.

141. (New) The isolated nucleic acid molecule of claim 128, wherein the nucleic acid molecule comprises the nucleotide sequence of SEQ ID NO:27.--

Currently Pending Claims

31. (Twice Amended) An isolated nucleic acid molecule encoding a human Fab molecule, comprising:

a first nucleotide sequence encoding a first polypeptide that is homologous to the binding portion of a $\gamma 1$ heavy chain variable region (V_H) of said human Fab molecule where said heavy chain region exhibits immunological binding affinity for a hepatitis C virus (HCV) E2 antigen; and wherein the first nucleotide sequence is selected from the group consisting of the contiguous sequence of depicted in Figure 4A (SEQ ID NO:22) or a contiguous sequence of nucleotides with at least 90% sequence identity thereto; the contiguous sequence of depicted in Figure 4B (SEQ ID NO:23) or a contiguous sequence of nucleotides with at least 90% sequence identity thereto; the contiguous sequence of depicted in Figure 4C (SEQ ID NO:24) or a contiguous sequence of nucleotides with at least 90% sequence identity thereto; the contiguous sequence of depicted in Figure 4D (SEQ ID NO:25) or a contiguous sequence of nucleotides with at least 90% sequence identity thereto; the contiguous sequence of depicted in Figure 4E (SEQ ID NO:19) or a contiguous sequence of nucleotides with at least 90% sequence identity thereto; the contiguous sequence of depicted in Figure 4F (SEQ ID NO:26) or a contiguous sequence of nucleotides with at least 90% sequence identity thereto; and the contiguous sequence of depicted in Figure 4G (SEQ ID NO:27) or a contiguous sequence of nucleotides with at least 90% sequence identity thereto; and

a second nucleotide sequence encoding a second polypeptide that is homologous to the binding portion of a κ light chain variable region (V_L) of said human Fab molecule where said light chain variable region exhibits immunological binding affinity for a hepatitis C virus (HCV) E2 antigen, and wherein the second nucleotide sequence is selected from the group consisting of the contiguous sequence of depicted in Figure 3A (SEQ ID NO:15) or a contiguous sequence of nucleotides with at least 90% sequence identity thereto; the contiguous sequence of depicted in Figure 3B (SEQ ID NO:16) or a contiguous sequence of nucleotides with at least 90% sequence identity thereto; the contiguous sequence of depicted in Figure 3C (SEQ ID NO:17) or a contiguous sequence of nucleotides with at least 90% sequence identity thereto; the contiguous sequence of

depicted in Figure 3D (SEQ ID NO:18) or a contiguous sequence of nucleotides with at least 90% sequence identity thereto; the contiguous sequence of depicted in Figure 3E (SEQ ID NO:19) or a contiguous sequence of nucleotides with at least 90% sequence identity thereto; the contiguous sequence of depicted in Figure 3F (SEQ ID NO:20) or a contiguous sequence of nucleotides with at least 90% sequence identity thereto; and the contiguous sequence of depicted in Figure 3G (SEQ ID NO:21) or a contiguous sequence of nucleotides with at least 90% sequence identity thereto, and wherein said Fab molecules have binding affinity greater than $1 \times 10^7 \text{ M}^{-1}$ for HCV E2.

32. The nucleic acid molecule of claim 31, further comprising:

a third nucleotide sequence encoding a first leader sequence peptide, wherein said third nucleotide sequence is operably linked to the 5' terminus of the first nucleotide sequence and is capable of causing secretion of the encoded heavy chain variable region when the encoded heavy chain variable region and the first leader sequence peptide are expressed; and

a fourth nucleotide sequence encoding a second leader sequence peptide, wherein said fourth nucleotide sequence is operably linked to the 5' terminus of the second nucleotide sequence and is capable of causing secretion of the encoded light chain variable region when the encoded light chain variable region and the second leader sequence peptide are expressed.

33. The nucleic acid molecule of claim 32, wherein the third and fourth nucleotide sequences are selected from the group of leader sequences consisting of *omp A* and *pefB*.

34. (Amended) The nucleic acid molecule of claim 31, wherein the first nucleotide sequence is depicted in Figure 4A (SEQ ID NO:22).

35. (Amended) The nucleic acid molecule of claim 31, wherein the first nucleotide sequence is depicted in Figure 4B (SEQ ID NO:23).

36. (Amended) The nucleic acid molecule of claim 31, wherein the first nucleotide sequence is depicted in Figure 4C (SEQ ID NO:24).

37. (Amended) The nucleic acid molecule of claim 31, wherein the first nucleotide sequence is depicted in Figure 4D (SEQ ID NO:25).

38. (Amended) The nucleic acid molecule of claim 31, wherein the first nucleotide sequence is depicted in Figure 4E (SEQ ID NO:19).

39. (Amended) The nucleic acid molecule of claim 31, wherein the first nucleotide sequence is depicted in Figure 4F (SEQ ID NO:26).

40. (Amended) The nucleic acid molecule of claim 31, wherein the first nucleotide sequence is depicted in Figure 4G (SEQ ID NO:27).

41. (Amended) The nucleic acid molecule of claim 31, wherein the second nucleotide sequence is depicted in Figure 3A (SEQ ID NO:15).

42. (Amended) The nucleic acid molecule of claim 31, wherein the second nucleotide sequence is depicted in Figure 3B (SEQ ID NO:16).

43. (Amended) The nucleic acid molecule of claim 31, wherein the second nucleotide sequence is depicted in Figure 3C (SEQ ID NO:17).

44. (Amended) The nucleic acid molecule of claim 31, wherein the second nucleotide sequence is depicted in Figure 3D (SEQ ID NO:18).

45. (Amended) The nucleic acid molecule of claim 31, wherein the second nucleotide sequence is depicted Figure 3E (SEQ ID NO:19).

46. (Amended) The nucleic acid molecule of claim 31, wherein the second

nucleotide sequence is depicted in Figure 3F (SEQ ID NO:20).

47. (Amended) The nucleic acid molecule of claim 31, wherein the second nucleotide sequence is depicted in Figure 3G (SEQ ID NO:21).

48. (Twice Amended) An isolated nucleic acid molecule, comprising a first nucleotide sequence encoding a binding portion of a $\gamma 1$ heavy chain variable region (V_H) of a human Fab molecule obtained from a combinatorial library, wherein said Fab molecule exhibits immunological binding affinity greater than $1 \times 10^7 M^{-1}$ for a hepatitis C virus (HCV) E2 antigen and further wherein the first nucleotide sequence is selected from the group consisting of the contiguous sequence of depicted in Figure 4A (SEQ ID NO:22) or a contiguous sequence of nucleotides with at least 90% sequence identity thereto; the contiguous sequence of depicted in Figure 4B (SEQ ID NO:23) or a contiguous sequence of nucleotides with at least 90% sequence identity thereto; the contiguous sequence of depicted in Figure 4C (SEQ ID NO:24) or a contiguous sequence of nucleotides with at least 90% sequence identity thereto; the contiguous sequence of depicted in Figure 4D (SEQ ID NO:25) or a contiguous sequence of nucleotides with at least 90% sequence identity thereto; the contiguous sequence of depicted in Figure 4E (SEQ ID NO:19) or a contiguous sequence of nucleotides with at least 90% sequence identity thereto; the contiguous sequence of depicted in Figure 4F (SEQ ID NO:26) or a contiguous sequence of nucleotides with at least 90% sequence identity thereto; and the contiguous sequence of depicted in Figure 4G (SEQ ID NO:27) or a contiguous sequence of nucleotides with at least 90% sequence identity thereto.

49. (Amended) The nucleic acid molecule of claim 48, wherein the first nucleotide sequence is depicted in Figure 4A (SEQ ID NO:22).

50. (Amended) The nucleic acid molecule of claim 48, wherein the first nucleotide sequence is depicted in Figure 4B (SEQ ID NO:23).

51. (Amended) The nucleic acid molecule of claim 48, wherein the first

nucleotide sequence is depicted in Figure 4C (SEQ ID NO:24).

52. (Amended) The nucleic acid molecule of claim 48, wherein the first nucleotide sequence is depicted in Figure 4D (SEQ ID NO:25).

53. (Amended) The nucleic acid molecule of claim 48, wherein the first nucleotide sequence is depicted in Figure 4E (SEQ ID NO:19).

54. (Amended) The nucleic acid molecule of claim 48, wherein the first nucleotide sequence is depicted in Figure 4F (SEQ ID NO:26).

55. (Amended) The nucleic acid molecule of claim 48, wherein the first nucleotide sequence is depicted in Figure 4G (SEQ ID NO:27).

56. (Twice Amended) An isolated nucleic acid molecule, comprising a first nucleotide sequence encoding a binding portion of a κ light chain variable region (V_L) of a human Fab molecule obtained from a combinatorial library, wherein said Fab molecule exhibits immunological binding affinity greater than $1 \times 10^7 \text{ M}^{-1}$ for a hepatitis C virus (HCV) E2 antigen and further wherein the first nucleotide sequence is selected from the group consisting of the contiguous sequence of depicted in Figure 3A (SEQ ID NO:15) or a contiguous sequence of nucleotides with at least 90% sequence identity thereto; the contiguous sequence of depicted in Figure 3B (SEQ ID NO:16) or a contiguous sequence of nucleotides with at least 90% sequence identity thereto; the contiguous sequence of depicted in Figure 3C (SEQ ID NO:17) or a contiguous sequence of nucleotides with at least 90% sequence identity thereto; the contiguous sequence of depicted in Figure 3D (SEQ ID NO:18) or a contiguous sequence of nucleotides with at least 90% sequence identity thereto; the contiguous sequence of depicted in Figure 3E (SEQ ID NO:19) or a contiguous sequence of nucleotides with at least 90% sequence identity thereto; the contiguous sequence of depicted in Figure 3F (SEQ ID NO:20) or a contiguous sequence of nucleotides with at least 90% sequence identity thereto; and the contiguous sequence of depicted in Figure 3G (SEQ ID NO:21) or a contiguous sequence of nucleotides with at

least 90% sequence identity thereto.

57. (Amended) The nucleic acid molecule of claim 56, wherein the second nucleotide sequence depicted in Figure 3A (SEQ ID NO:15).

58. (Amended) The nucleic acid molecule of claim 56, wherein the second nucleotide sequence is depicted in Figure 3B (SEQ ID NO:16).

59. (Amended) The nucleic acid molecule of claim 56, wherein the second nucleotide sequence is depicted in Figure 3C (SEQ ID NO:17).

60. (Amended) The nucleic acid molecule of claim 56, wherein the second nucleotide sequence is depicted in Figure 3D (SEQ ID NO:18).

61. (Amended) The nucleic acid molecule of claim 56, wherein the second nucleotide sequence is depicted in Figure 3E (SEQ ID NO:19).

62. (Amended) The nucleic acid molecule of claim 56, wherein the second nucleotide sequence is depicted in Figure 3F (SEQ ID NO:20).

63. (Amended) The nucleic acid molecule of claim 56, wherein the second nucleotide sequence is depicted in Figure 3G (SEQ ID NO:21).

64. An expression vector, comprising the nucleic acid molecule of claim 31 operably linked to control sequences that direct the transcription of the first and second nucleotide sequences whereby said first and second nucleotide sequences can be transcribed and translated in a host cell.

65. The expression vector of claim 64, wherein the control sequences are capable of directing the transcription of the first and second nucleotide sequences in a prokaryotic host cell.

66. The expression vector of claim 64, wherein the control sequences are capable of directing the transcription of the first and second nucleotide sequences in a eukaryotic host cell.

67. An expression vector, comprising the nucleic acid molecule of claim 48 operably linked to control sequences that direct the transcription of the first nucleotide sequence whereby said first nucleotide sequence can be transcribed and translated in a host cell.

68. The expression vector of claim 67, wherein the control sequences are capable of directing the transcription of the first nucleotide sequence in a prokaryotic host cell.

69. The expression vector of claim 67, wherein the control sequences are capable of directing the transcription of the first nucleotide sequence in a eukaryotic host cell.

70. An expression vector, comprising the nucleic acid molecule of claim 56 operably linked to control sequences that direct the transcription of the first nucleotide sequence whereby said first nucleotide sequence can be transcribed and translated in a host cell.

71. The expression vector of claim 70, wherein the control sequences are capable of directing the transcription of the first nucleotide sequence in a prokaryotic host cell.

72. The expression vector of claim 70, wherein the control sequences are capable of directing the transcription of the first nucleotide sequence in a eukaryotic host cell.

73. A prokaryotic host cell transformed with the expression vector of claim 65.

74. A prokaryotic host cell transformed with the expression vector of claim 68.

75. A prokaryotic host cell transformed with the expression vector of claim 71.

76. A eukaryotic host cell transformed with the expression vector of claim 66.
77. A eukaryotic host cell transformed with the expression vector of claim 68.
78. A eukaryotic host cell transformed with the expression vector of claim 72.
79. A method of producing a recombinant human Fab molecule, comprising:
(a) providing a population of transformed host cells according to claim 76; and
(b) expressing said recombinant Fab molecule from the expression vector.
80. A method of producing a recombinant polypeptide having a binding portion of a $\gamma 1$ heavy chain variable region (V_H) of a human Fab molecule, comprising:
(a) providing a population of transformed host cells according to claim 77; and
(b) expressing said recombinant polypeptide from the expression vector.
81. A method of producing a recombinant polypeptide having a binding portion of a κ light chain variable region (V_L) of a human Fab molecule, comprising:
(a) providing a population of transformed host cells according to claim 78; and
(b) expressing said recombinant polypeptide from the expression vector.
117. The isolated nucleic acid molecule of claim 31, wherein the human Fab molecule encoded by the first and second nucleotide sequences comprises the contiguous sequence of amino acids depicted in Figure 1A (SEQ ID NO: 1) and the contiguous sequence of amino acids depicted in Figure 2A (SEQ ID NO: 5).
118. The isolated nucleic acid molecule of claim 31, wherein the human Fab molecule encoded by the first and second nucleotide sequences comprises the contiguous sequence of amino acids depicted in Figure 1B (SEQ ID NO: 2) and the contiguous sequence of amino acids depicted in Figure 2B (SEQ ID NO: 6).
119. The isolated nucleic acid molecule of claim 31, wherein the human Fab

molecule encoded by the first and second nucleotide sequences comprises the contiguous sequence of amino acids depicted in Figure 1C (SEQ ID NO: 3) and the contiguous sequence of amino acids depicted in Figure 2C (SEQ ID NO: 7).

120. The isolated nucleic acid molecule of claim 31, wherein the human Fab molecule encoded by the first and second nucleotide sequences comprises the contiguous sequence of amino acids depicted in Figure 1D (SEQ ID NO: 4) and the contiguous sequence of amino acids depicted in Figure 2D (SEQ ID NO: 8).

121. An isolated nucleic acid molecule that encodes a recombinant human monoclonal antibody that exhibits immunological binding affinity for a hepatitis C virus (HCV) E2 antigen, wherein the antibody comprises at least one group of three complementarity determining regions (CDRs) interposed between framework regions (FRs) said FRs derived from a human immunoglobulin, wherein the group of three CDRs is selected from the group consisting of amino acid residue numbers 32-36, 51-71, 104-121 of SEQ ID NO:1; amino acid residue numbers 32-36, 51-67, 100-116 of SEQ ID NO:2; amino acid residue numbers 32-36, 51-67, 100-117 of SEQ ID NO:3; amino acid residue numbers 31-35, 50-66, 99-114 of SEQ ID NO:4; amino acid residue numbers 23-34, 49-56, 89-97 of SEQ ID NO:5; amino acid residue numbers 23-33, 49-55, 88-95 of SEQ ID NO:6; amino acid residue numbers 23-34, 50-56, 89-97 of SEQ ID NO:7; and amino acid residue numbers 23-33, 49-55, 88-96 of SEQ ID NO:8.

122. The isolated nucleic acid molecule of claim 121, wherein the antibody encoded by the nucleic acid molecule comprises a first group of CDRs with amino acid residue numbers 32-36, 51-71, 104-121 of SEQ ID NO:1 interposed between FRs, and a second group of CDRs with amino acid residue numbers 23-34, 49-56, 89-97 of SEQ ID NO:5, interposed between FRs, wherein the first and second groups of CDRs interposed between FRs together form a binding site for an HCV E2 antigen.

123. The isolated nucleic acid molecule of claim 121, wherein the antibody comprises a first group of CDRs with amino acid residue numbers 32-36, 51-67, 100-116

of SEQ ID NO:2 interposed between FRs, and a second group of CDRs with amino acid residue numbers 23-33, 49-55, 88-95 of SEQ ID NO:6, interposed between FRs, wherein the first and second groups of CDRs interposed between FRs together form a binding site for an HCV E2 antigen.

124. The isolated nucleic acid molecule of claim 121, wherein the antibody comprises a first group of CDRs with amino acid residue numbers 32-36, 51-67, 100-117 of SEQ ID NO:3 interposed between FRs, and a second group of CDRs with amino acid residue numbers amino acid residue numbers 23-34, 50-56, 89-97 of SEQ ID NO:7 interposed between FRs, wherein the first and second groups of CDRs interposed between FRs together form a binding site for an HCV E2 antigen.

125. The isolated nucleic acid molecule of claim 121, wherein the antibody comprises a first group of CDRs with amino acid residue numbers amino acid residue numbers 31-35, 50-66, 99-114 of SEQ ID NO:4 interposed between FRs, and a second group of CDRs with amino acid residue numbers 23-33, 49-55, 88-96 of SEQ ID NO:8 interposed between FRs, wherein the first and second groups of CDRs interposed between FRs together form a binding site for an HCV E2 antigen.

126. A method for providing an antibody titer to HCV in a mammalian subject, comprising introducing a therapeutically effective amount of the composition comprising the isolated nucleic acid of claim 120 to said subject.

127. A method for providing an antibody titer to HCV in a mammalian subject, comprising introducing a therapeutically effective amount of the vaccine composition of claim 121 to said subject.

128. (New) An isolated nucleic acid molecule encoding a human Fab molecule, wherein the nucleic acid molecule comprises a nucleotide sequence selected from the group consisting of SEQ ID NO:15, SEQ ID NO:16, SEQ ID NO:17, SEQ ID NO:18, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22, SEQ ID NO:23, SEQ

ID NO:24, SEQ ID NO:25, SEQ ID NO:26, and SEQ ID NO:27.

129. (New) The isolated nucleic acid molecule of claim 128, wherein the nucleic acid molecule comprises the nucleotide sequence of SEQ ID NO:15.

130. (New) The isolated nucleic acid molecule of claim 128, wherein the nucleic acid molecule comprises the nucleotide sequence of SEQ ID NO:16.

131. (New) The isolated nucleic acid molecule of claim 128, wherein the nucleic acid molecule comprises the nucleotide sequence of SEQ ID NO:17.

132. (New) The isolated nucleic acid molecule of claim 128, wherein the nucleic acid molecule comprises the nucleotide sequence of SEQ ID NO:18.

133. (New) The isolated nucleic acid molecule of claim 128, wherein the nucleic acid molecule comprises the nucleotide sequence of SEQ ID NO:19.

134. (New) The isolated nucleic acid molecule of claim 128, wherein the nucleic acid molecule comprises the nucleotide sequence of SEQ ID NO:20.

135. (New) The isolated nucleic acid molecule of claim 128, wherein the nucleic acid molecule comprises the nucleotide sequence of SEQ ID NO:21.

136. (New) The isolated nucleic acid molecule of claim 128, wherein the nucleic acid molecule comprises the nucleotide sequence of SEQ ID NO:22.

137. (New) The isolated nucleic acid molecule of claim 128, wherein the nucleic acid molecule comprises the nucleotide sequence of SEQ ID NO:23.

138. (New) The isolated nucleic acid molecule of claim 128, wherein the nucleic acid molecule comprises the nucleotide sequence of SEQ ID NO:24.

139. (New) The isolated nucleic acid molecule of claim 128, wherein the nucleic acid molecule comprises the nucleotide sequence of SEQ ID NO:25.

140. (New) The isolated nucleic acid molecule of claim 128, wherein the nucleic acid molecule comprises the nucleotide sequence of SEQ ID NO:26.

141. (New) The isolated nucleic acid molecule of claim 128, wherein the nucleic acid molecule comprises the nucleotide sequence of SEQ ID NO:27.